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Implementation of Android-Based Flutter Framework and Waterfall Method in Building Marketplace Applications (MariUmroh)

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Abstract

Marketplace application aims to facilitate prospective pilgrims and Umrah and Hajj travel companies in interacting, transacting, and promoting their products online. In its business process, the MariUmroh application uses a B2C (Business to Customer) business model. Where business activities are carried out by travel admins to customers using electronic media directly. The development of the Android-based MariUmroh application is built with the Flutter Framework which uses the Dart programming language. In building the MariUmroh marketplace application, the development system uses the waterfall method, in its creation it begins with needs analysis, system design, writing program code, program testing, program implementation and maintenance. In the MariUmroh application which offers various Umrah and Hajj travel packages to the wider community easily and more efficiently, and sellers can easily promote their products and do not need to be afraid of losing consumers, the features provided by the application are also very useful for pilgrims while performing worship in the holy land. In building this application, MySQL is used as a database in data storage.

Keywords: Marketplace, Umrah and Hajj travel, flutter framework, Waterfall

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1. Introduction

The rapid development of technology has made human life easier. Especially since the internet and smartphones, communication has become more unlimited and without barriers. Information is disseminated in various formats in various media. We can share information using text, photos, sound, or video. The internet is one of the modern media that can spread information quickly. The growing platform is Android, a service that can adapt, connect to each other, and is not limited by space or time [1]. Due to the development of science and technology that facilitates fast access to information in various aspects of life, the use of information technology has now grown quite rapidly. One of them is in the field of online sales, which is often referred to as the marketplace. communication media has developed, so travel agency entrepreneurs are entering the world of online sales.

One of the concepts that is growing in the online the purpose of this research is to create an Umrah and Hajj travel marketplace application using the Android-based Flutter framework to provide solutions to entrepreneurs providing Umrah and Hajj travel agencies in marketing their products easily and efficiently. With this platform, it is hoped that prospective pilgrims will find it easy to find travel and Umrah and Hajj worship packages and are supported by features to make it easier to carry out worship. Business sector is the marketplace. Consumers, producers, and sellers can all benefit and benefit from using this system. Online shopping offers a number of benefits and conveniences compared to traditional shopping methods. [2]. As time goes by, travel agents for Umrah and Hajj travel have made innovations in promoting their products and services by registering them on the available marketplace platform so that their offerings have a wider reach and are right on target for prospective pilgrims. On the other hand, this Umrah and Hajj travel marketplace platform can make it easier for

prospective pilgrims to search for Hajj and Umrah packages and of course in finding a safe and trustworthy travel agency marked with a permit certificate from the Ministry of Religion, and this marketplace has security in accepting applicants for each travel company.

In creating the Umrah and Hajj travel marketplace, the author uses the Flutter framework. Google created Flutter, an SDK (Software Development Kit) to create mobile applications. This framework can be used to build or develop mobile applications that can run on iOS and Android devices. Made using C, C++, Dart and Skia languages, Flutter is one of the most useful and interesting frameworks. Another interesting thing about this framework is that all the code is compiled in native code (Android NDK, LLVM, AOT-compiled) without an interpreter in the process, so the compilation process is faster. [3]. Dart is an object-oriented language with C-style syntax that can be optionally converted to JavaScript. It supports a variety of programming tools such as interfaces, classes, collections, generics, and optional typing. Application developers who we usually know as developers. They work at Google and other large companies use Dart to build quality Android, iOS and Web applications. Dart provides features that Client Side Development (Development from the client side) which is why many developers choose to use Dart. [4]. The operating system used is Android.

Android is a Linux-based operating system, middleware, and application for mobile devices. Android offers developers a free platform to build their own applications. [5] Android can be considered as a “bridge” between the device and the user, so users can engage with their devices and use the available applications. [6].

Previous research related to the problems described above is in the scientific paper "Design and Construction of an Android-Based Hajj and Umrah Bureau Activity Information Application (CASE STUDY PT. AS-SALAM RAHMAN AL-MUGHNI)" (Rahman, 2019) in the scientific paper the application built is an e-commerce application that offers services to a travel agent. This application only displays a menu related to travel offers, there are no other supporting menus [7]. in the second research of the scientific paper entitled "Designing a Web-Based Umrah Registration Application at Nurrahma Tour & Travel" (Anwar, Syaiful., & Hilpiah, Dida. (2020)) this scientific paper is an online Umrah registration where previously registration was done manually online so it was less effective and efficient. [8]. In the third research paper entitled "Implementation of the Flutter Framework in the Mosque Library Information System (Case Study: Mosques in Pontianak City)" (Muslim., Renny Puspita., Syahru Rahmayuda (2022)) The results of this study are in the form of a mobile-based library information system

using the Flutter framework as a front-end and web-based using the Laravel framework as a back-end that can make it easier for mosque institutions to manage library material assistance from the Ministry of Religion of West Kalimantan Province, make it easier for the public to carry out book borrowing and return services and reduce the risk of losing books [9].

The purpose of this research is to create an Umrah and Hajj travel marketplace application using the Android-based Flutter framework to provide solutions to Umrah and Hajj travel agency entrepreneurs in marketing their products easily and efficiently. With this platform, prospective pilgrims are facilitated in finding travel and Umrah and Hajj worship packages and are supported by features to make it easier to carry out worship.

2. Research Methods

In this study, the author uses several research methodologies with literature studies to develop this software, the author looks for literature or library sources related to the software to be created. These library sources will help the author in writing existing theories, and can be used as a comparison with the research that has been done. Then using the observation method, which is carried out to collect data by conducting direct observations in the field, then systematically recording the object. Observing all aspects that are in accordance with the needs of making the application. After observation and data collection are carried out, the software development method will be carried out, the method used in making this project is the waterfall method.. [10]. The Waterfall SDLC model is a sequential software development process where the progress of software development is like a stream flowing down (similar to a waterfall) through a list of stages that must be carried out to successfully build a computer software. Originally, the waterfall model was proposed by Winston W. Royce in 1970 to describe software engineering practices. The waterfall model defines a series of successive phases that must be completed one after another and move to the next phase only when the previous phase has been completely completed [11].

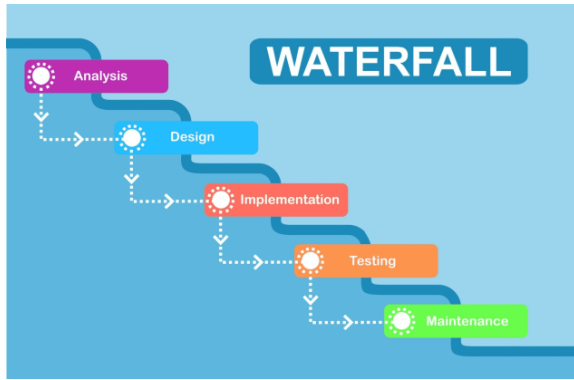


Figure 2.1 Waterfall Method Workflow

2.1 Needs Analysis

This step is an analysis of the needs of the system creation. Data collection in this stage conducts research, interviews or literature studies. The author examines the needs of the system to be built based on the problems of the current system, including what needs to be done in the new system to solve the problem.

2.2 Desain Sistem

The design process will translate the requirements into a software design that can be estimated before coding. In this design process, it displays a visual display of the design and system flow to the user. The author explains what activities this system can do through use-case illustrations. [12].

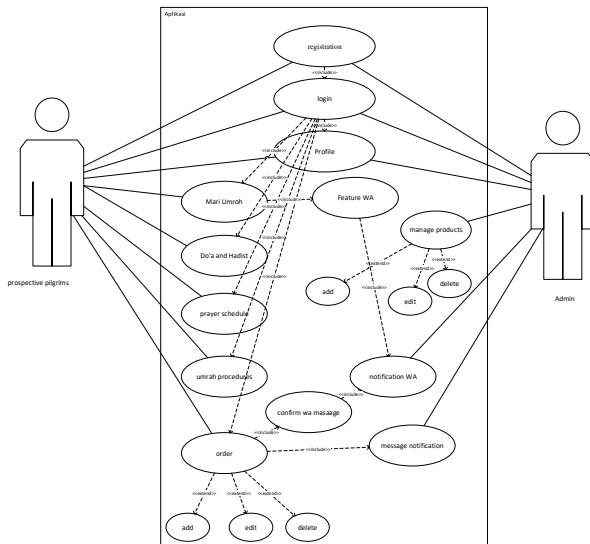


Figure 2.2. Use Case Diagram

Registration Activity Diagram

Registration activity starts from the activity of opening the application, then inputting the name, travel nana, address, email, mobile number, correct password then

the data is successfully saved. After the system will display the admin main page.

The following is a design of the Admin Registration Activity Diagram:

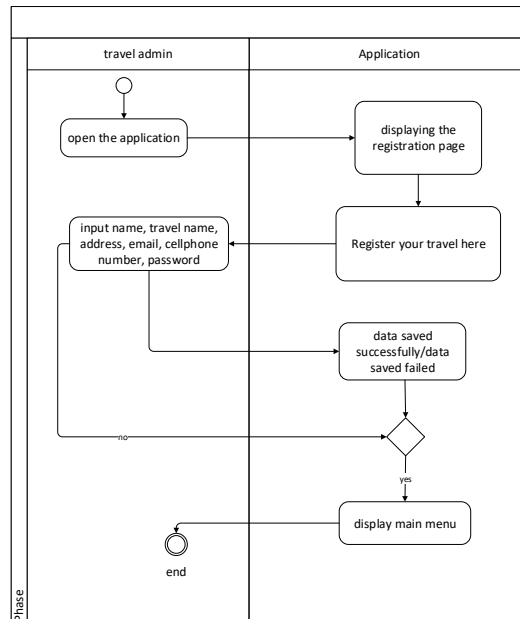


Figure 2.3 Activity Diagram Admin Registration

Registration activity starts from the activity of opening the application, then inputting the full name, email, cellphone number, correct password then the data is successfully saved. After the system will display the admin main page.

The following is a draft Activity Diagram for Prospective Congregation Registration:

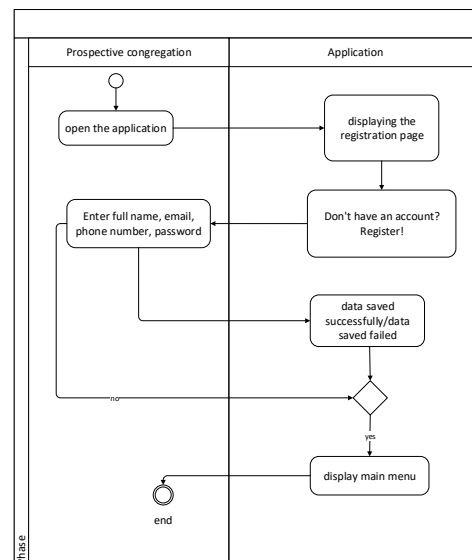


Figure 2.4 Activity Diagram for Congregation Registration

Activity Diagram for Registration as a customer starts from the activity of opening the application, then inputting the full name, email, cellphone number, password correctly, then the data is successfully saved. After the system will display the main page as a customer with a menu display. Activity Diagram for Ordering Online Travel Packages

The activity of ordering online travel packages is described in the following activity design steps:

The following is a design for the Activity Diagram for Ordering Online Travel Packages

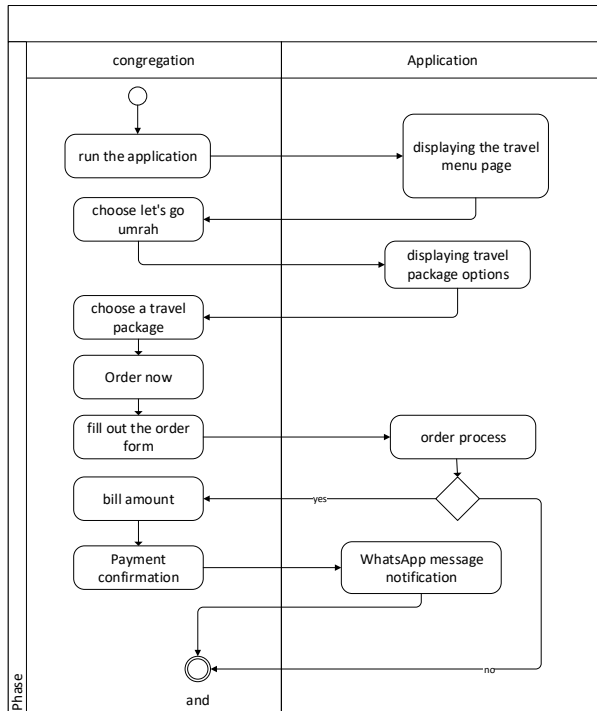


Figure 2.5 Activity Diagram of Online Travel Package Orders

The Activity Diagram for Ordering Online Travel Packages as a customer starts from the activity of opening the application, then logging into the account, then entering the menu display and being able to access it, customers can choose Umrah travel along with product offers from them and can order Umrah travel until payment, this application also provides a WA admin link for each travel company

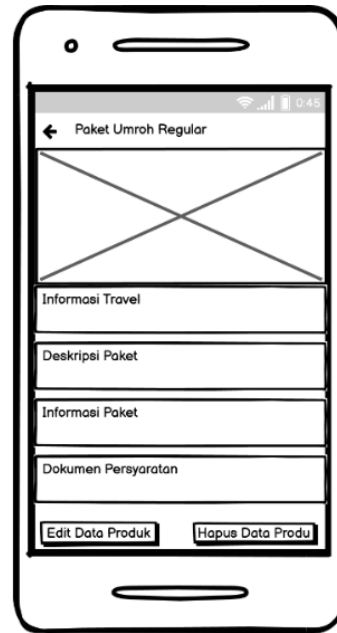


Figure 2.6 Home Page Mockups

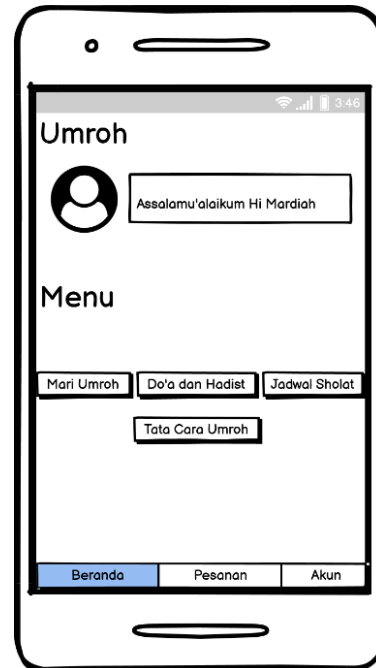


Figure 2.7 Product Page Mockups

In Figures 2.6 and 2.7 are the design of the interface display for the Umrah and Hajj travel marketplace application that will be created.

2.3 Program Code Creation

To be understood by the machine, in this case a computer, the design of the application form must be changed into a language that can be understood by the machine, namely into a programming language through

the coding process. In this case the author uses Visual Studio Code, the flutter framework, the dart programming language and the MySQL database.

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Figure 2.5. Coding Creation Page Mockups

2.4 Testing

The application that has been completed is then tested to find out whether the application has run well and to find out errors in the application's operation. In the testing stage, the author uses the black box method as the system testing stage. [13].

2.5 Implementation and Maintenance of the Program

After the testing stage and the application runs as desired, the application can be used by users, in this case, Hajj and Umrah travel entrepreneurs and prospective customers in searching for information on Hajj and Umrah departures, the application that has been used continues to be maintained and developed. [14].

3. Results and Discussion

System implementation is the steps or procedures taken in completing an approved system design, testing, and starting a new system that has been refined [15]. where the author creates or works on a design that has been designed through the Mockups application, in building this application using the Flutter framework Dart programming language, to create its appearance using Visual Studio Code as a text editor, which is capable of using various programming languages.

3.1. Implementation of Application Registration and Homepage Mokeup.

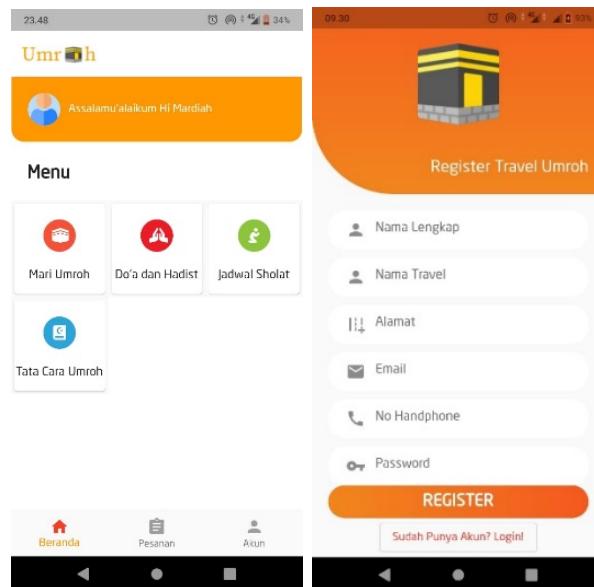


Figure 3.1 Application Registration and Home Page

Figure 3.1 is an implementation of the design of the registration page and the application homepage. The appearance of the application homepage is part of the main menu that can be accessed by prospective pilgrims, the homepage presents several features to make it easier for pilgrims to find travel and worship packages. Other features make it easier for pilgrims to carry out worship comfortably.

3.2 Implementation of the Add Umrah Package Product Page Mokeup

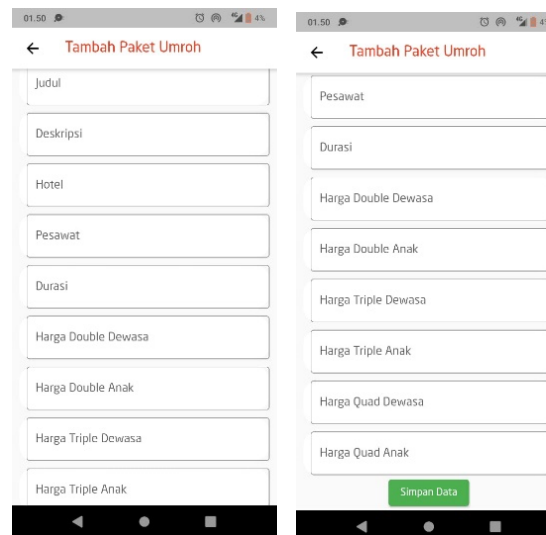


Figure 3.2 Add Umrah Package Product Page

Figure 3.2 is an implementation of the product page design for adding Umrah and Hajj pilgrimage travel packages that can be accessed by travel admins. On this page, admins can add, edit, and delete travel products.

3.3. Implementation of Product Page Display Mockup

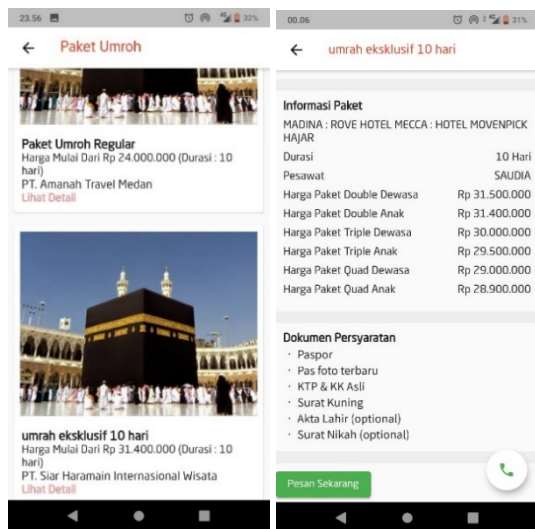


Figure 3.3 Umrah Package Product Page

Figure 3.3 This stage displays the results of the construction process that has been carried out. The results displayed here are the main page of the travel packages offered by travel agents registered in the marketplace, this page can be accessed by prospective pilgrims in finding a worship package that suits their wishes, this page also describes what facilities are offered by each travel agent. On this page you can order directly online or ask for information via the WA feature that has been displayed, then it will be connected by the admin WA.

3.4 Super Admin Page View Mockup Implementation

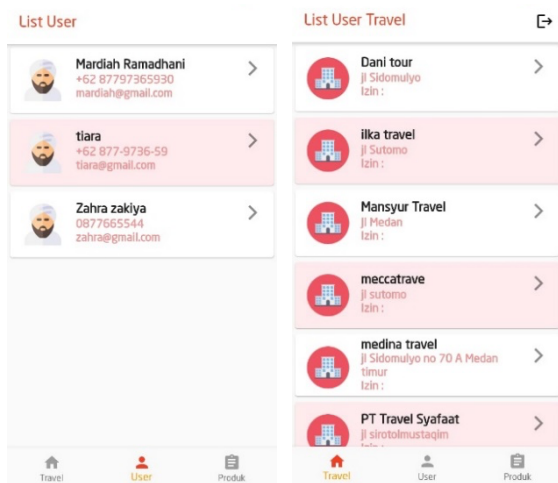


Figure 3.4 Super Admin Page

Figure 3.4 This stage displays the results of the construction process that has been carried out. The results displayed here are the main page of the super admin, the super admin task is to manage the application and select each registered travel agent, the existence of a

super admin is to secure the marketplace and filter the registered travel agents.

4. Conclusion

Based on the research conducted by the author, the following conclusions were obtained:

The application that I designed and built can help make it easier for prospective pilgrims or users to search for travel packages, umrah and hajj and order products online. This application also helps umrah and hajj travel business actors to market their products more widely. This application is built using the Flutter framework which has a more contemporary and attractive appearance.

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